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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/600,685	06/20/2003	Sung-Kee Kim	5000-1-363	6740

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EXAMINER

MALKOWSKI, KENNETH J

ART UNIT	PAPER NUMBER
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2613

DATE MAILED: 07/13/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

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Office Action Summary	Application No. 10/600,685	Applicant(s) KIM ET AL.	
	Examiner Kenneth J. Malkowski	Art Unit 2613	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 20 June 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☐ Claim(s) _____ is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-14 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 20 June 2003 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>6/10/03 & 5/10/04</u> 6/19/06 | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Drawings

1. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the “X-cut type Mach-Zehnder interference type light intensity modulators” as claimed in claims 6 and 9 must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as “amended.” If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either “Replacement Sheet” or “New Sheet” pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claim 1 recites the limitation "the precoded NRZ optical signal" in line 6 of claim 1.

There is insufficient antecedent basis for this limitation in the claim.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

5. Claims 1-13 are rejected under 35 U.S.C. 102(e) as being anticipated by U.S. Patent No. 6,388,786 to Ono et al.

With respect to claims 1 and 12, Ono discloses a duobinary optical transmission apparatus (title, method for generating duobinary signal and optical transmitter using the same method) comprising: a light source arranged to output an optical carrier (1, Figures 15, 23 (light source, semiconductor laser)); an NRZ optical signal generator (2, Fig 23)(2nd MZ modulator shown in 19, Fig 15) arranged to receive an NRZ electrical signal (Fig 10A (input data signal 6))(shown input to intensity modulator 2, fig 23), to modulate the optical carrier into an NRZ optical signal according to the NRZ electrical signal (output of 2, Fig 23 is inherently an optical NRZ signal as it is modulated by an NRZ electrical data signal 6, Fig 23), and to output the NRZ optical signal; and a duobinary optical signal generator (arranged to receive the pre-coded NRZ electrical signal (column 2 lines 48-51 (a binary electrical signal fro driving an optical modulator is used to generate a duobinary signal))(data signal 6 is sent to pre-coder 7, Fig 23) and to modulate the NRZ optical signal into a duobinary optical signal (through phase modulator 3, Fig

23)(column 2 lines 58 (optical intensity modulator which modulates the signal light according to a data signal, and an optical phase modulator which phase-modulates the intensity-modulated signal light according to an output signal of a pre-coder)).

With respect to claim 2, Ono discloses the duobinary optical transmission apparatus as claimed in claim 1, wherein the NRZ optical signal generator (2, Fig 23)(2nd MZ modulator shown in 19, Fig 15) includes: a plurality of first modulator driving amplifiers that amplify and output the NRZ electrical signal (21, Fig 15 (driving amplifiers)); and a light intensity modulator that modulates an intensity of the optical carrier (2, Fig 23)(2nd MZ modulator shown in 19, Fig 15)(column 2 lines 58-60 (optical intensity modulator driven according to a data signal)) according to driving signals input from the first modulator driving amplifiers (signals with driving amplifiers 21, are shown input to both MZ modulators depicted in 19, Fig 15)).

With respect to claim 3, Ono discloses the duobinary optical transmission apparatus as claimed in claim 1, wherein the duobinary optical signal generator includes: a pre-coder arranged to encode the NRZ electrical signal (pre-coder 7, Figures 15 and 23)(column 2 lines 61-62 (a pre-coder which inputs a second data signal generated by dividing a data signal into two signals)); a plurality of second modulator driving amplifiers that amplify and output the encoded signal (Driving amplifiers 21, which proceed the pair of driving amplifiers 21 depicted in Fig 15); and a light phase modulator that modulates a phase of the NRZ optical signal according to driving signals input from the second modulator driving amplifiers (1st MZ modulator shown in 19, Fig 15)(fig 23, phase modulator 3))(column 2 lines 58 (optical intensity modulator which modulates the signal light according to a data signal, and an optical phase modulator which

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phase-modulates the intensity-modulated signal light according to an output signal of a pre-coder)).

With respect to claim 4, Ono discloses the duobinary optical transmission apparatus as claimed in claim 2, wherein the light intensity modulator is a Mach-Zehnder interference type modulator (column 1 lines 38-50 (the optical transmitter use in this optical duobinary technique...optical intensity modulator is a Mach-Zehnder (MZ) interferometer with modulation terminals connected to both arms)).

With respect to claims 5-6, Ono discloses a duobinary optical transmission apparatus as claimed in claim 4, wherein the Mach-Zehnder interference type modulator is a dual armed Z-cut Mach-Zehnder interference type light intensity modulator (2nd MZ modulator shown in 19, Fig 15 (dual arm)). Ono also teaches an embodiment wherein the Mach-Zehnder interference type modulator is a single armed X-cut modulator (Figures 8, 11 and 27). Furthermore, applicant states that Z-cut and X-cut modulators are functionally equivalent (page 5 lines 3-5 (Z-cut or X-cut))(page 8-9 lines 20-25 and 1-2 (either modulator may be employed)). Finally, the X-cut modulator is not even shown in the drawings.

With respect to claims 7, Ono discloses the duobinary optical transmission apparatus as claimed in claim 3, wherein the light phase modulator is a Mach-Zehnder interference type modulator (3, Fig 8)(column 7 lines 4-7 (output of laser is input to a MZ or LN optical phase modulator)).

With respect to claims 8-9, Ono discloses the duobinary optical transmission apparatus as claimed in claim 7, wherein the Mach-Zehnder interference type modulator is a dual armed Z-cut

Mach-Zehnder interference type light intensity modulator (2nd MZ modulator shown in 19, Fig 15 (dual arm)). Ono also teaches an embodiment wherein the Mach-Zehnder interference type modulator is a single armed X-cut modulator (Figures 8, 11 and 27). Furthermore, applicant states that Z-cut and X-cut modulators are functionally equivalent (page 5 lines 3-5 (Z-cut or X-cut))(page 8-9 lines 20-25 and 1-2 (either modulator may be employed)). Finally, the X-cut modulator is not even shown in the drawings.

With respect to claim 10, Ono discloses the duobinary optical transmission apparatus as claimed in claim 2, wherein the duobinary optical signal generator includes: a pre-coder (pre-coder 7, Figures 15 and 23)(column 2 lines 61-62 (a pre-coder which inputs a second data signal generated by dividing a data signal into two signals) arranged to encode the NRZ electrical signal (Fig 10A (input data signal 6)); a plurality of second modulator driving amplifiers that amplify and output the encoded signal (21, Fig 15 (driving amplifiers)); and a light phase modulator that modulates a phase of the NRZ optical signal according to driving signals input from the second modulator driving amplifiers (1st MZ modulator shown in 19, Fig 15)(fig 23, phase modulator 3))(column 2 lines 58 (optical intensity modulator which modulates the signal light according to a data signal, and an optical phase modulator which phase-modulates the intensity-modulated signal light according to an output signal of a pre-coder)).

With respect to claim 11, Ono disclose the duobinary optical transmission apparatus as claimed in claim 1, wherein the NRZ electrical signal (Figure 10 A) is generated by a pulse pattern generator (any digital data signal with a combination of zeros and ones as shown in Figure 10A must inherently be generated in some sort of pattern). Furthermore, Applicant adds to the inherency of a pulse pattern generator by not disclosing said pulse pattern

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generator in any embodiment of the disclosed invention, only the resulting data line (Figure 4 of applicants specification). The only time the applicant shows a pulse pattern generator is in a prior art drawing (Figure 1 of applicants specification).

With respect to claim 13, Ono discloses the method as claimed in claim 12, further comprising the step of outputting the duobinary optical signal to an optical fiber (Column 7 lines 38-45 (When signal light 4 is transmitted through optical fiber)).

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claim 14 is rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,388,786 to Ono et al. in view of U.S. Patent No. 6,563,623 to Penninckx et al.

With respect to claim 14, Ono discloses the method as claimed in claim 12, however, Ono fails to disclose a variable extinction ratio. Penninckx, from the same field of endeavor discloses the step of changing a dispersion factor of the optical fiber by adjusting an extinction ratio and a chirp variable of the modulator (abstract, control phase optical signal complementary phase and/or power modulation so as to respectively modify its extinction ratio and/or apply a transient “chirp” to it))(column 3 lines 46-49 (adjust the extinction ratio at the transmitter)). Penninckx also uses Mach-Zehnder modulators (column 4 lines 26-43) as was taught by Ono. The motivation for doing so would have been to reduce noise-generated degradation (Penninckx: column 3 lines 46-47) and to make the system more flexible to use (Penninckx: abstract) by

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making it easier to optimize for each type of optical link and for each transmission distance

(Penninckx: column 4 lines 1-2).

Conclusion

8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The following references are cited to show the state of the art with respect to Ethernet framed passive optical networks in general:

U.S. Patent Application Publication No. 20010017724 is cited to show an optical transmission system

U.S. Patent No. 5,543,952 is cited to show an optical transmission system

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kenneth J. Malkowski whose telephone number is (571) 272-5505. The examiner can normally be reached on M-F 8:30-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ken Vanderpuye can be reached on (571) 272-3078. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

KJM 6/03/06



KENNETH VANDERPUYE
SUPERVISORY PATENT EXAMINER